



# EAGLE – An MOAO fed dIFU working in the NIR on the E-ELT

EAGLE is intended to be a workhorse instrument for the E-ELT combining the AO and 3D advantages of SINFONI on the VLT with the survey gains of KMOS, coupled with the collecting power of a 39m primary.

It will enable the collection of statistically meaningful samples of high spatial-resolution 3D spectra of galaxies across almost the whole of cosmic history, and will be a unique capability for the E-ELT, given current large telescope instrument plans. (See talk by Jean-Gabriel Cuby)

It will utilise Multi Object Adaptive Optics (MOAO), which has been demonstrated by CANARY on the WHT using natural guide stars. (See talk by Thierry Fusco)

This allows access to the full designed Field-of-View of the E-ELT. It will thus be the only E-ELT instrument which fully exploits the capabilities designed into the high-quality five-mirror and AO-corrected optical system of the E-ELT.

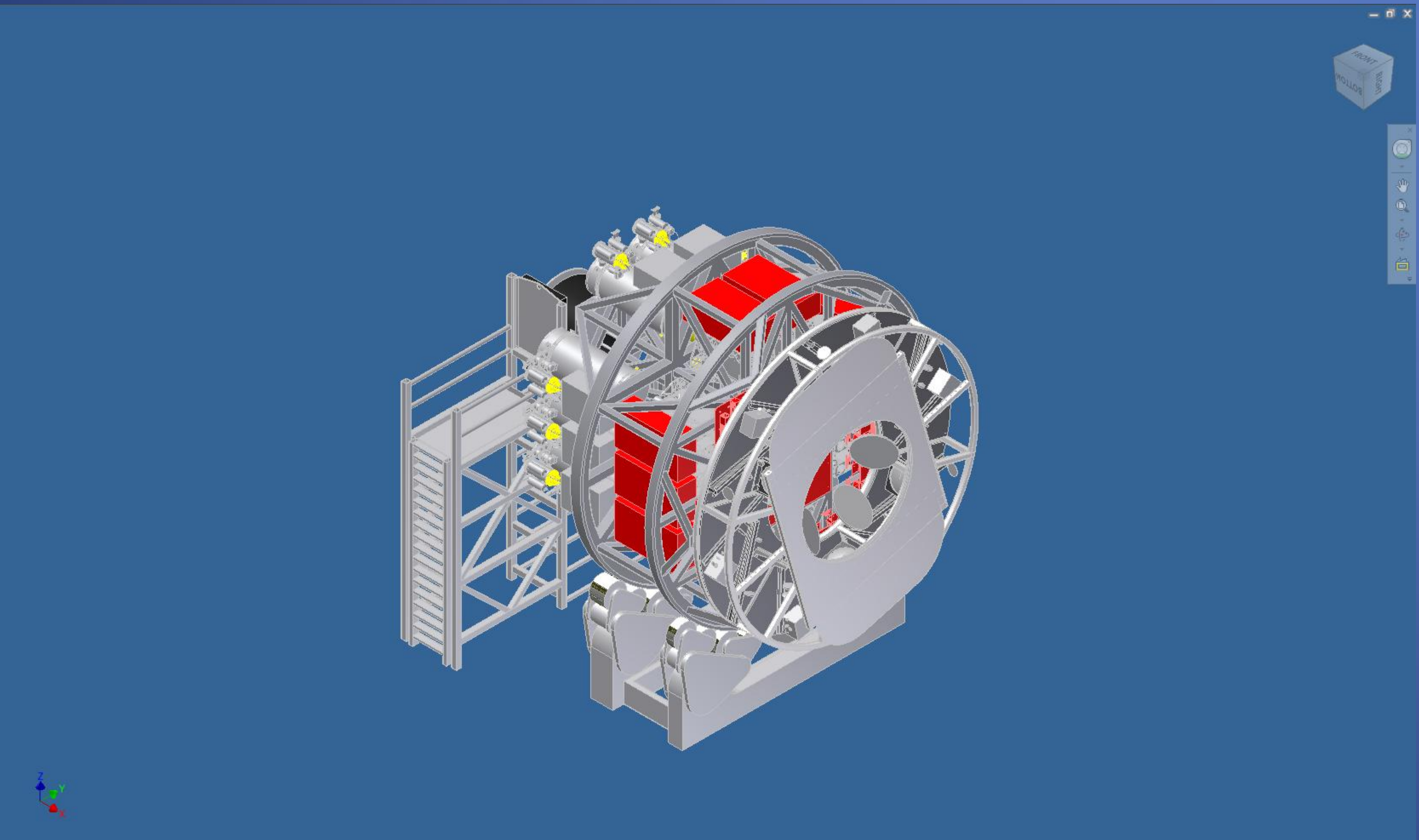
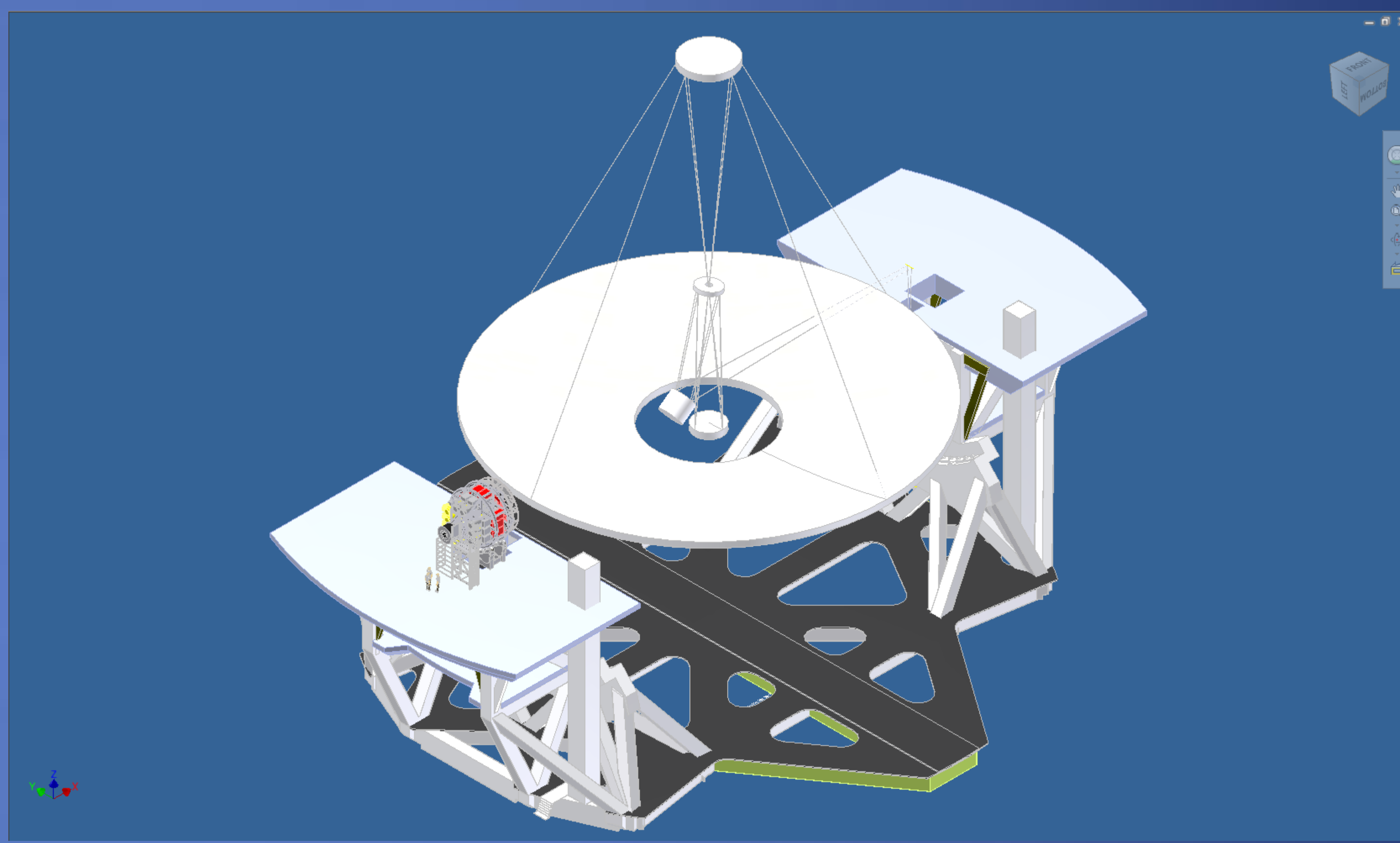
**Simon Morris,  
Jean-Gabriel Cuby  
and the EAGLE  
Team**

The EAGLE Phase A design study was concluded in November 2009.

Over the past year ESO have revisited the design of the E-ELT in a delta Phase B study, leading to de-scopes (to reduce cost) that include a slightly smaller primary aperture, and removal of the Gravity Invariant Focal Station (GIFS).

The Phase A EAGLE concept was designed to be located at the GIFS, thus the consortium decided to assess the implications for the instrument of being mounted on its side on the conventional Nasmyth platform. (See image opposite showing EAGLE in location on the E-ELT Nasmyth platform.)

This analysis demonstrated that the EAGLE concept is compatible with the revised E-ELT baseline.



Based on a preliminary analysis:

- EAGLE can be installed on the Nasmyth platform by designing a new instrument core. (See image opposite showing new EAGLE instrument core and support structures.)
- This can be done without any degradation in performance compared to the GIFS design

This preliminary study does not yet optimise the instrument mechanical design for the new location; however, this can be further optimised by taking advantage of the new volume envelope available.

We have found that that there are no serious additional risks produced by moving the instrument from the GIFS to the straight-through Nasmyth focal station of the E-ELT.